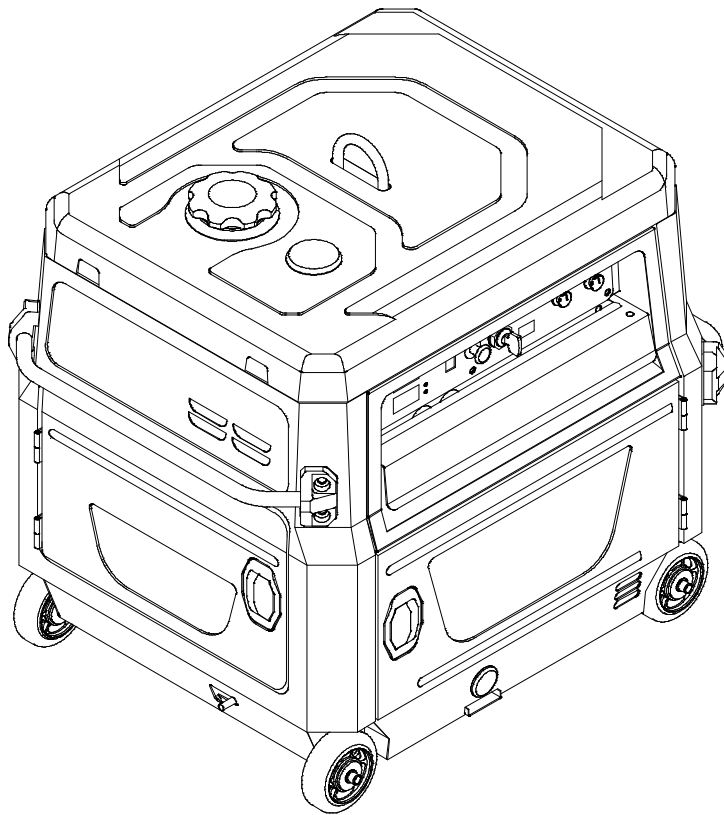




Soundproof Gasoline Engine-Driven DC Welder

Instruction manual

GAW-185ES2



- For ensuring safety, make sure to read this manual prior to use of the machine.
- For ensuring safety, be sure to observe precautions given under headings  DANGER and  CAUTION.
- For ensuring safety, keep this manual in a place of easy access, to permit reference to it whenever it is needed.

Thank you very much for your recent selection of a Denyo product.

- ◆ This is a noise isolated engine welder & generator combined machine (hereinafter called "machine"). (See Page 40 for the specification.)
- ◆ For handling of the machine and for working with the welder and generator functions of the machine, observe applicable laws (Electricity Enterprises Law, Electric Engineering Technicians Law, Occupational Health and Safety Law, Fire Services Act, Noise Control Law, etc.) as well as their relevant laws and regulations.
- ◆ This machine falls into the category of mobile electric works specified in the Electricity Enterprises Law. It is necessary to carry out its handling, reporting and others in accordance with its relevant laws and regulations.

This instruction manual ...

- ◆ This instruction manual explains correct handling method, simple inspection and care of the machine, for permitting safe operation of the machine and for fully exhibiting the machine performance.
- ◆ For ensuring safety, it is essential that qualified persons or those who understand welders and who have knowledge and skill to safely handle welders implement installation, inspection, maintenance and repair to the machine.

Erroneous handling of the machine may lead to serious injury or even loss of life.

Make sure to carefully read this manual and fully understand its contents before use of the machine.

- ◆ If you lend the machine to somebody else or allow such a person to use the machine, make sure to explain the machine handling method and instruct him to read this "Instruction manual" before use of the machine.
- ◆ See the covenant for product warranty attached hereto regarding product warranty.
- ◆ Keep this manual in a fixed place of easy access that permits reference to it whenever it is needed.
- ◆ See the engine instruction manual (separate volume) for handling, maintenance and others of the engine. For matters that are described in both of this manual and the engine instruction manual, observe instructions given in this manual.
- ◆ If this machine is mounted on a vehicle, it is not permitted to cause the vehicle to travel in the state where this machine is running.
- ◇ If you lose this instruction manual or if this instruction manual becomes illegible because of contamination or the like, give us an order for a new instruction manual.
- ◇ There is a possibility where the contents of this manual do not meet your machine due to changes to the specification.
- ◇ Enter the name of the sales representative, workshop for servicing and serial number of the machine in the applicable columns appearing below upon purchase of the machine.
"The contact for inquiries is shown on the back cover of this instruction manual."

If you any doubt arises or if you want to learn more about maintenance of the machine, please do not hesitate to contact us. When you contact us for an inquiry, please give us the type and serial number of the machine.

The serial number is stamped on the main nameplate.

Window for contact:

In-charge sales office:

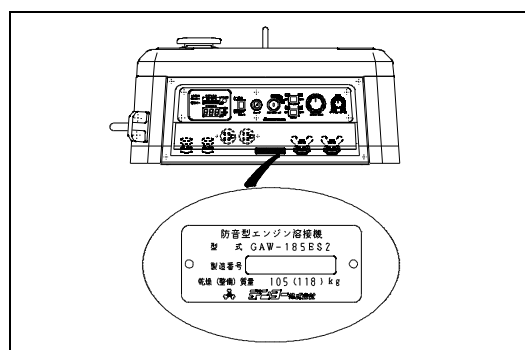
Workshop for servicing:



Your machine is ...









型 式	製 造 番 号
GAW-185ES2	

です。



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For safe use of the machine

- Although the machine has been designed and produced with safety fully taken into account, it is essential to observe the precautions given in this instruction manual in the use of the machine. Death or serious injury may arise, if the machine is used with these precautions ignored.

- ◆ Safety precautions are described in this manual as ranked using signal words indicated below.




DANGER: Death or serious injury may arise, if the machine is erroneously handled.



CAUTION: Personal injury of either medium or minor extent as well as damage to properties may occur, if the machine is erroneously handled.

[Caution] :

Attention is required for permitting the machine to work efficiently and for an extended period of time.

Even a matter described under the heading of  **CAUTION** may lead to serious results depending on the circumstances. All of these precautions describe important matters. Make sure to observe them.

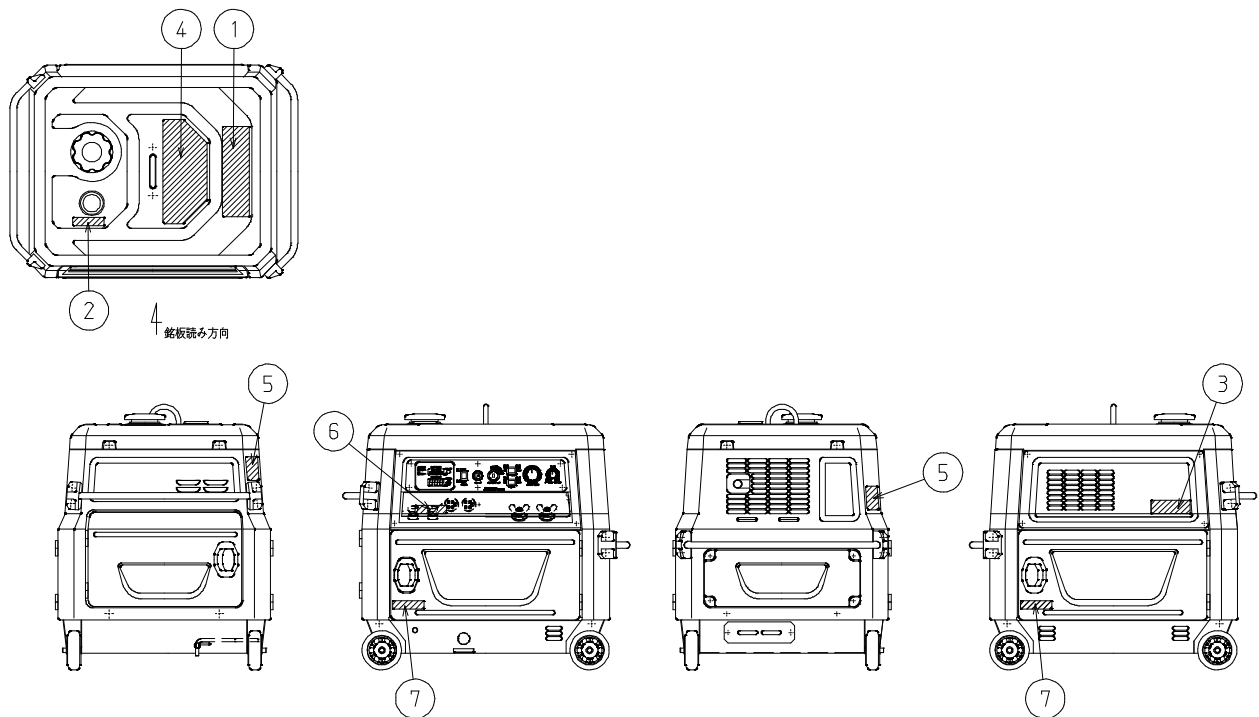
- Do not modify the machine without our permission. Safety may be destroyed and drop in functions and lifetime may result.
- The warranty expires if the machine is modified without our permission, if the machine is used in a manner that is different from what are described in the instruction manual or if any component of the machine is replaced with other than genuine parts.

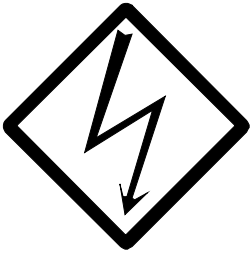
Mounting position of the warning nameplate


Warning label is attached to the position shown in the figure below to the machine body.


- Keep clean always warning nameplate.
- If a warning nameplate is lost or damaged, please order to DENYO by nameplate number that is described below in () immediately. Please paste again to the specified location.


- ① NOTE : Welding, exhaust gas, high temperature (D1510 0190A)
- ② NOTE : Fire (D1520 0190A)
- ③ NOTE : The fire due to fuel (D1520 0080A)
- ④ Handling Warning (D1510 0180A)
- ⑤ Ban lifting (B9121 0020B)
- ⑥ Electrical Hazard (D1510 0210A)
- ⑦ Runaway machine (D1520 0150A)

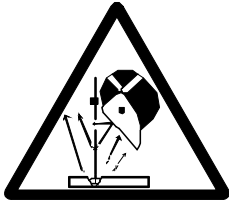


<p>⚠ DANGER: Electric shock</p> <ul style="list-style-type: none"> • Never touch electrical components such as output terminal and internal wiring while the machine is running. For cable connection or for inspection and maintenance of the machine, be sure to turn OFF the circuit breaker and stop the engine, before starting such a work. • When the machine or your body is wet, it is extremely dangerous. Never touch the machine in such a state. <p>Electric shock that leads to death may arise, if the above precautions are neglected.</p>	
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<p>⚠ DANGER: Poisoning caused by exhaust gas</p> <ul style="list-style-type: none"> • The exhaust gas from the engine contains substances that are hazardous to human bodies. Do not run the machine in a place of inferior ventilation such as tunnel and indoors. If it is necessary to run the machine in such a place, provide sufficient ventilation using ventilating equipment or the like. Furthermore, never direct the exhaust to passers, private homes and others. <p>Serious injury or death may arise due to oxygen deficiency or toxic gas, if the above precautions are neglected.</p>	
---	---

<p>⚠ DANGER: Personal injury</p> <ul style="list-style-type: none"> • There are components rotating at high speed in the machine. • Make sure to stop the engine, before starting maintenance and inspection of the machine. <p>Personal injury may arise due to roll-in of your hands by rotating components, if you fail to observe the precautions given above.</p>	
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<p>⚠ CAUTION: Fire</p> <ul style="list-style-type: none"> • Fuel and oil are combustible materials. Never bring any fire close to the machine. Do not use the machine in a place where the machine is exposed to sparks of welding or of a sander. Do not perform fueling while you are smoking or while the machine is running. • If the fuel or oil has spilt, fully wipe it off. <p>Ignition or kindling may occur, a fire may arise and burn injury may result, if you fail to observe the precautions given above.</p>	
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<p>⚠ CAUTION: Eye deficiency</p> <ul style="list-style-type: none"> • Always use a helmet and a hand shield for execution of welding work, for protection of eyes against harsh light and for protection of face and neck against the radiant energy directly irradiated from the arc. <p>Eye deficiency will occur if welding work is executed with naked eyes.</p>	
---	---

**CAUTION: Burn injury**

Never open the following places while the machine is running and also immediately after termination of running.

(1) Radiator water filler cap

If the water filler cap is opened while the machine is running, steam or hot water will jet out, and is extremely dangerous. Therefore, never open the water filler cap while the machine is running. Wait for at least 10 minutes after termination of running, before opening the cap.

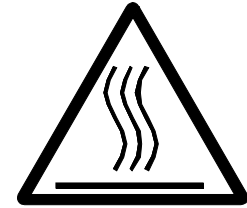
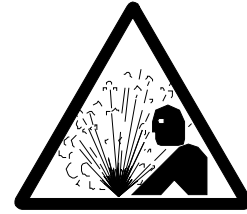
Furthermore, wear safety glasses and gloves, space your face away from the cap, fit thick rag on the cap and slowly turn the cap to relieve the pressure in the radiator before removing the cap.

(2) Never touch any high temperature portion.

Never touch the tail pipe, exhaust pipe and others, which are of high temperature while the machine is running and also immediately after termination of running.

Never touch the tail pipe, exhaust pipe and others, which are of high temperature while the machine is running and also immediately after termination of running.

Burn injury will occur to your hands, if the above precautions are neglected.

**CAUTION: Removal****(1) Falling during hoisting**

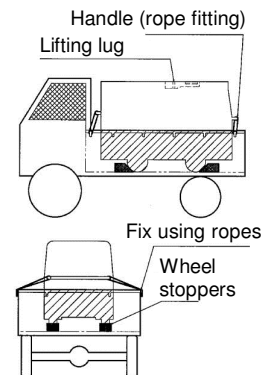
- Use the lifting lug located at the center of the roof panel for hoisting the machine. Furthermore, do not walk in to the space underneath the machine in the hoisted state.
- Do not hoist the machine by the handle (rope fitting).

The handle will come off and the machine will fall if the machine is hoisted by the handle.

(2) Falling during conveyance

- For conveyance of the machine on a truck or the like, fix two handles using ropes or the like so that the machine will not move out of the position.
- In case the machine is provided with wheels, positively lock the wheels.

The machine will fall, if the above precautions are neglected.

**CAUTION: Precautions on piling**

- Assure that bonnets are free of damage and that bolts are free of looseness and miss-out, before piling of machines.
- Place machines in horizontal positions on a solid ground that bears the weight of piled machines. Piling should not exceed two tiers.
- Locate square timbers between tiers, and equally locate machines on these timbers. Moreover, take appropriate measures for preventing horizontal displacement and falling that may be caused by earthquake.

Erroneous piling may result in occurrence of collapse and falling troubles.

⚠ CAUTION: Casualty caused by battery

(1) Casualty caused by battery electrolyte

Be careful so as not to allow entry of battery electrolyte (dilute sulfuric acid) into eyes and not to allow its attachment to the skin or clothes. If it entered eyes or attached to the skin, immediately wash it off using plenty of water. In case of entry to eyes, submit to medical treatment.

Casualty to eyes and burn may result otherwise.

(2) Explosion caused by battery's flammable gases

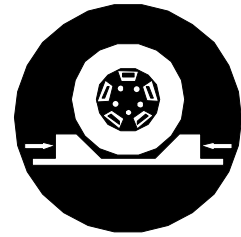
The battery produces flammable gases. Therefore, be careful not to allow sparking from the battery and not to bring any fire such as cigarette close to the battery.

Ignition and explosion may arise otherwise.

⚠ CAUTION: Wheel stoppers

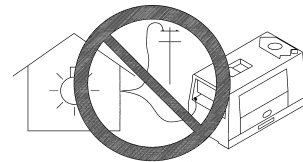
- Use the machine in a level position on a solid ground. If the machine is used on a slope under unavoidable circumstances, the tolerance in the gradient is $\pm 5^\circ$ on each of longitudinal and lateral directions.
- Make sure to lock wheels using wheel stoppers, except the occasion of removal.

The machine may begin to move and run away, unless wheel stoppers are fitted.



⚠ CAUTION: No connection to indoor wiring

- Never connect the AC power supply of the machine to any indoor wiring.
- Connection to indoor wiring violates a law, and in addition, may cause damage to both of the indoor wiring and the machine.



⚠ CAUTION : No use in the rain

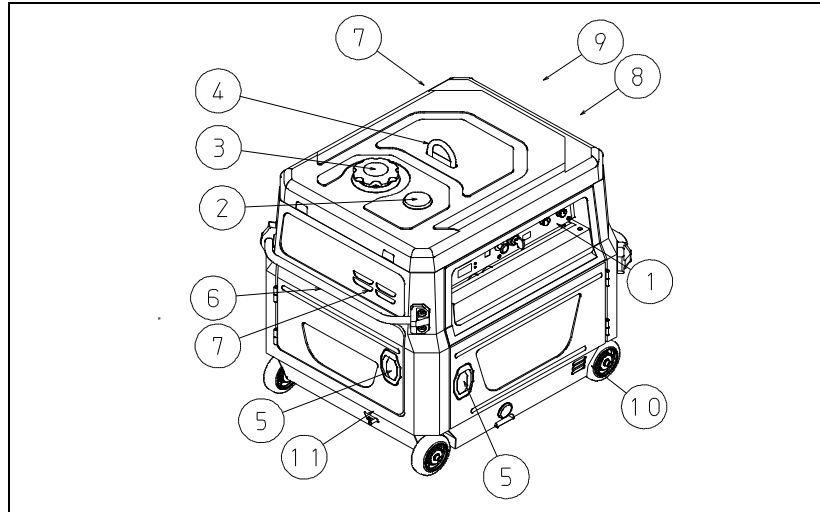
- Failure may arise due to wetting of the machine and electrical components with rainwater. Do not use the machine in the rain.
- Avoid water washing of the machine interior because of the same reason.



1. Names of components

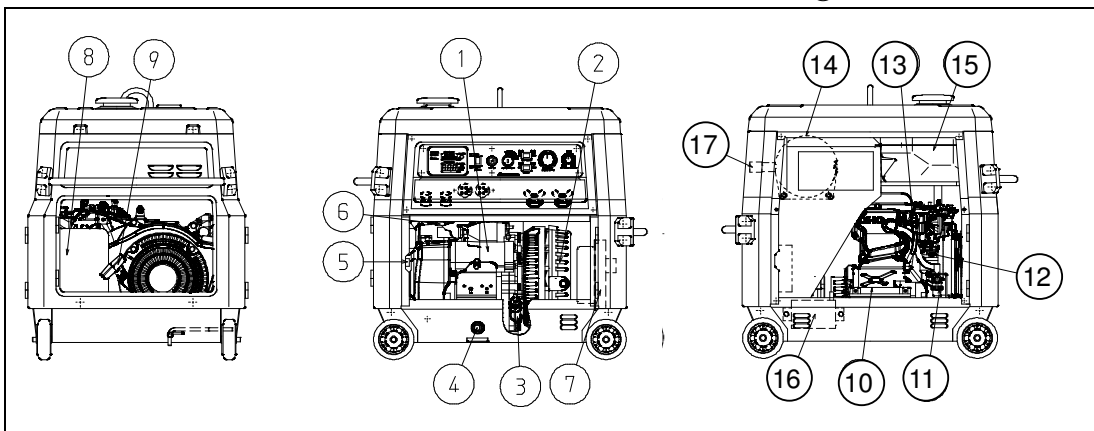
1-1 External appearances and names of components

- | | | |
|--------------------|-------------------------|-----------------|
| ① Operation panel | ⑥ Handle (rope fitting) | ⑪ Wheel stopper |
| ② Fuel Gauge | ⑦ Air inlet | |
| ③ Fuel filler port | ⑧ Exhaust port | |
| ④ Lifting lug | ⑨ Air outlet | |
| ⑤ Door handle | ⑩ Wheel | |



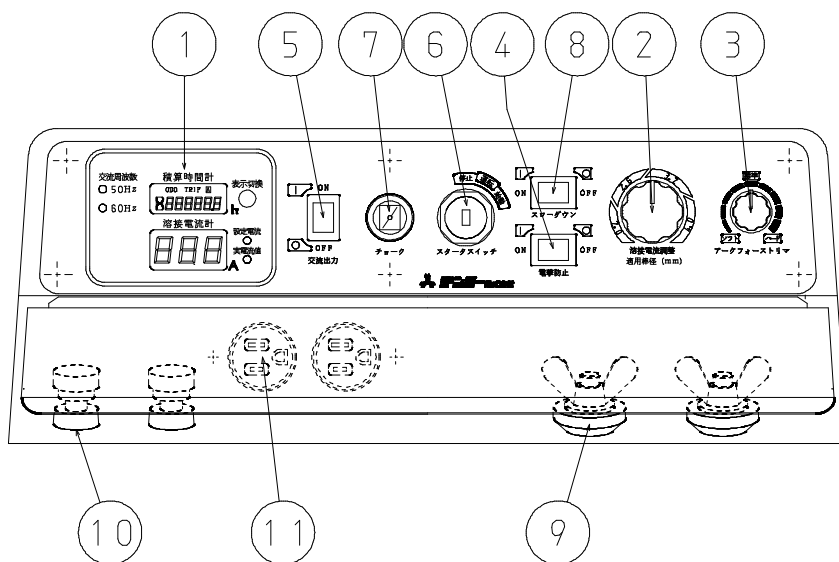
1-2 Names of internal components

- | | | |
|-------------------------------|------------------|-----------------------|
| ① Engine | ⑥ Fuse | ⑪ Fuel Strainer |
| ② Generator | ⑦ Reactor | ⑫ Carburetor |
| ③ Oil filler port / Oil gauge | ⑧ Air cleaner | ⑬ Spark Plug |
| ④ Oil drain | ⑨ Recoil starter | ⑭ Muffler |
| ⑤ 50Hz/60Hz select switch | ⑩ Battery | ⑮ Fuel tank |
| | | ⑯ Reactor |
| | | ⑰ Muffler tail screen |



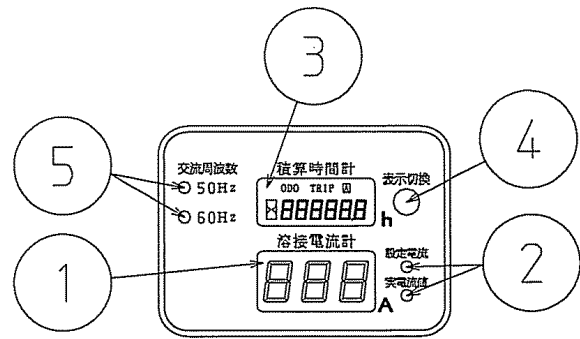
1-3 Operation panel and names of components

No.	Name
1	*Digital monitor (*Model GAW-150ES2D only)
2	Welding current regulator
3	Arc force regulator
4	Voltage reduction device switch
5	AC Power output switch
6	Starter switch
7	Choke knob
8	Slow down switch
9	Welding output terminal
10	Single phase AC power output terminal
11	Single phase AC power output receptacle



1-4 Digital display monitor

- ①Welding current meter
- ②Set / actual current indicator
- ③ODO meter (section hour meter function)
- ④Display switching button
- ⑤Frequency indicator



(1) Welding current meter

- Welding current meter displays the actual current value and the current setting of the welding output. Welding current meter displays the actual current value during welding. The welding current meter displays the setting value under welding stop. The welding current is adjusted by turning the knob of the welding current regulator.
- If the protective device of the machine is operated during operation, display of welding current meter will switch to abnormal Symbol. In that case, please identify the abnormal portion from Symbol. And, check and maintenance.

(2) ODO meter (ODO)

- This will display the accumulated operating time of the machine. Hour meter will start the integration when the starter switch set to the "driving" position. Clock mark of the display unit blinks during integration.

[Note] : When operating on without battery, hour meter counts the operating time from after the engine is started.

[Note] : If you do not use the welder a long period of time, the internal battery of the digital display monitor is exhausted. And, it may be integrated time meter stopped does not display. Accumulated time meter is even no longer displayed, the integration time is not reset. In this case, when the starter switch set to the "operation", it displays the hour meter by using a power from battery. Internal battery for the monitor is charged with be operated to start the engine.

(3) Time interval meter (TRIP)

- Time interval meter is built with "A" and "B".

When it is in the "ON" position starter switch, each time you press the display switching button, the display screen will be switched in the order of "ODO" → "TRIP A" → "TRIP B".

When each interval time is displayed, hold down the display switching button. The display time is reset and return to 0.

- Please use as a time meter of periodic inspection and maintenance for such as oil change.

[NOTE] : When starter switch is the "OFF" position, the display automatically return to Integrated time meter (ODO).

(4) Frequency indicator

- It displays the frequency of output for AC power source.

Frequency can be switched at a frequency selector switch on the left side of the door inside the control panel under.

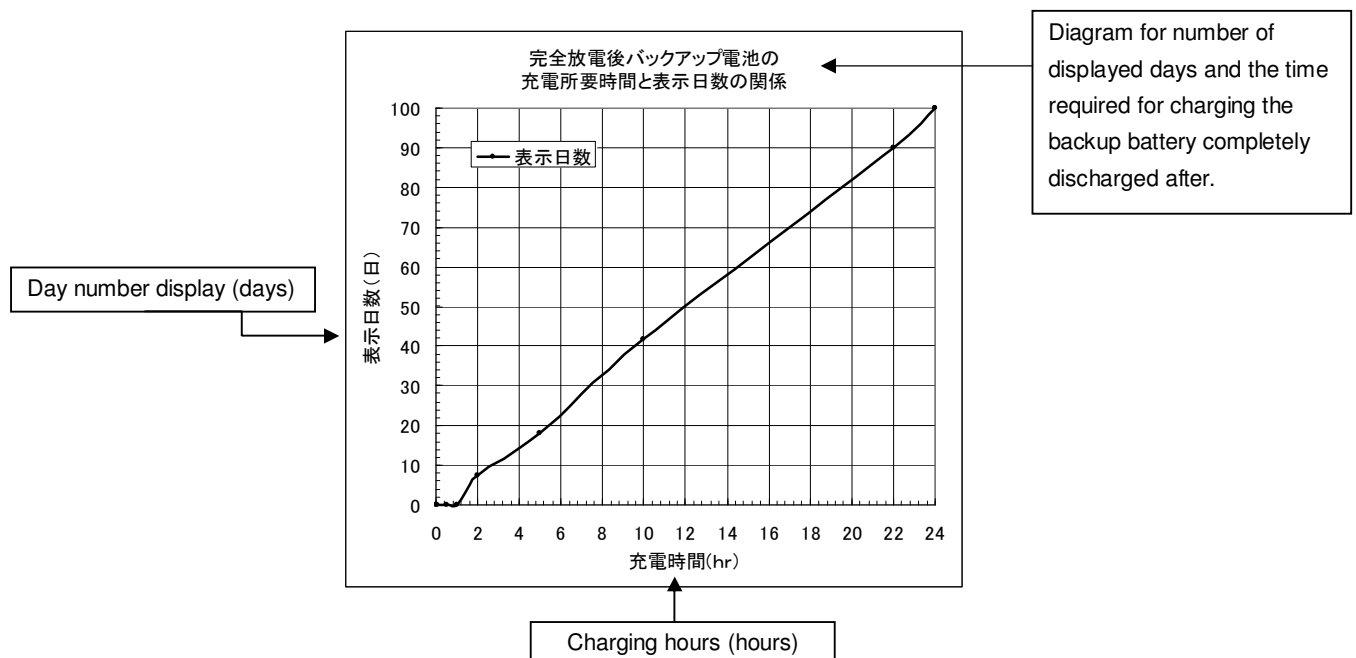
[Note] : Do not change the frequency on the loaded condition. It causes of the failure of the control unit.

[Note] : Before using the welder, check the frequency of load side and display of the machine. it should be same.

(5) Internal Battery for ODO meter display

- Digital display monitor has a built-in charging circuit and the internal rechargeable batteries. ODO meter is displayed by a power source of internal battery when the machine will stop. And charges the internal battery by operating the engine.

- Internal battery is completely discharged If you do not use the machine for a long period. Then, takes a while the battery will be activated, and ODO meter will not display. If you charge the battery about 30 minutes, then ODO meter displays 30 minutes or so. However, it will be possible to display more than 10 days if you charge 3 hours or more. Refer the following diagram as a guide for day number display and time of charging hours.



2. Conveyance and installation

2-1 Precautions for conveyance of the machine

CAUTION: Removal

(1) Falling during hoisting

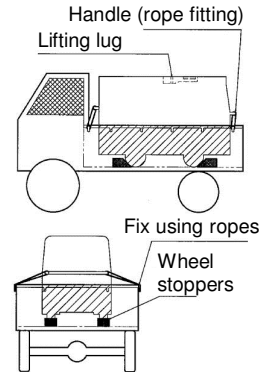
- Use the lifting lug located at the center of the roof panel for hoisting the machine. Furthermore, do not walk in to the space underneath the machine in the hoisted state.
- Do not hoist the machine by the handle (rope fitting).

The handle will come off and the machine will fall if the machine is hoisted by the handle.

(2) Falling during conveyance

- For conveyance of the machine on a truck or the like, fix two handles using ropes or the like so that the machine will not move out of the position.
- In case the machine is provided with wheels, positively lock the wheels.

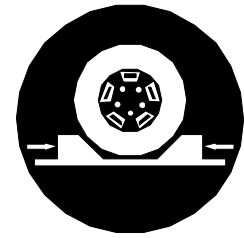
The machine will fall, if the above precautions are neglected.



CAUTION: Wheel stoppers

- Use the machine in a level position on a solid ground. If the machine is used on a slope under unavoidable circumstances, the tolerance in the gradient is $\pm 5^\circ$ on each of longitudinal and lateral directions.
- Make sure to lock wheels using wheel stoppers, except the occasion of removal.

The machine may begin to move and run away, unless wheel stoppers are fitted.



For conveyance of the machine from the field of work, be sure to load the machine on a truck or the like.

Dimensions of the machine are as follows.

Length (mm)	Width (mm)	Height (mm)	Dry mass (kg)	Fully equipped mass (kg)
730	555	675	105	118

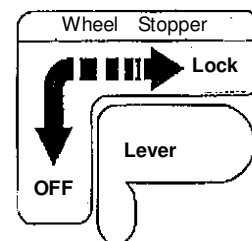
Dry mass: Mass without cooling water, lubricating oil and fuel

Fully equipped mass: Mass with cooling water, lubricating oil, battery electrolyte (to the specified level) and fuel (full tank)

See "External dimensions and appearance drawing" for details.

Wheel Stopper

- The machine equipped wheel stopper and operate Lock/Off by the lever
- Make sure to wheel stopper lock position, when operate the machine and conveyance of the machine on a truck
- When move the machine by wheel, make sure to wheel stopper off position.



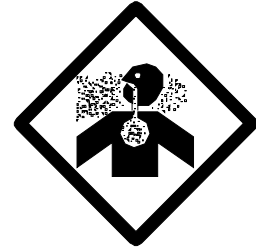
2-2 Precautions for installation of the machine



DANGER: Poisoning caused by exhaust gas

- The exhaust gas from the engine contains substances that are hazardous to human bodies.
Do not run the machine in a place of inferior ventilation such as tunnel and indoors.
If it is necessary to run the machine in such a place, provide sufficient ventilation using ventilating equipment or the like.
Furthermore, never direct the exhaust to passers, private homes and others.

Serious injury or death may arise due to oxygen deficiency or toxic gas, if the above precautions are neglected.



Select a place that satisfies the following conditions for installation of the machine.

- (a) Select a level place. If the machine is used on a slope under unavoidable circumstances, the allowable inclination angle is $\pm 5^\circ$ in both of longitudinal and lateral directions. Apply appropriate slip stoppers. Fit wheel stoppers, if the machine is equipped with wheels.

[Caution]: If inflammable substances (such as paper dust and wood chips) and/or dangerous substances (such as oil and Output name powder) are found in the vicinity, remove them before starting welding work.

[Caution]: Provide protection screens or the like around the place of welding work, for preventing scattering of arc light and spatter.

- (b) Avoid a place of high temperature and high humidity.
 (c) Avoid a place of ambient temperature over 40°C.
 (d) Avoid a dusty place and place where noxious gases or explosive gases are present. Furthermore, space the machine from inflammable goods in the surroundings.
 (e) Locate the machine in a place where welding spatter and grinder (sander) sparks enter the air inlet and outlet of the machine.
 (f) This machine cannot be piled in tiers, as it is equipped with wheels.
 (g) Never run this machine while the vehicle, on which this machine is located, is traveling or while the machine is suspended in the air.
 (h) For the bonnet air intake, provide a space of at least 50 cm from the wall face or other obstacles.

[Caution]: Overheat may arise, if the machine is run in a small space. If it is necessary to run the machine under such a condition that the clearance from any side of the machine is less than 50 cm, please consult with us.

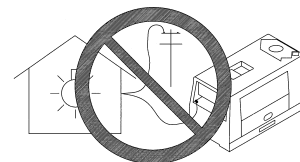
[Prohibited matters]

- (1) No connection to indoor wiring

- Never connect the AC power supply of the machine to any indoor wiring.
- Connection to indoor wiring violates a law, and in addition, may cause damage to both of the indoor wiring and the machine.

- (2) No use in the rain

- Failure may arise due to wetting of the machine and electrical components with rainwater. Do not use the machine in the rain.
- Avoid water washing of the machine interior because of the same reason.



3. Operation

3-1 Pre-operational inspection



DANGER: Personal injury

- There are components rotating at high speed in the welder.
- Make sure to stop the engine, before starting maintenance and inspection of the welder.

Personal injury may arise due to roll-in of your hands by rotating components, if you fail to observe the precautions given above.



Carry out inspection described below prior to operation.

(1) Check of engine oil level

Fully insert the engine oil level gauge, and check if the oil level is within the range of “H” level and “L” level on the level gauge. Check the oil for contamination at the same time.

Replenish oil if the oil level is less than the “L” level (lower limit).

[Caution]: The oil level should not be higher than the “H” level (upper limit). Damage to engine cylinder interior may occur otherwise.

Regarding engine oil

Engine oil exerts major influence over the engine performance, startability, lifetime and others. Therefore, select engine oil of viscosity that is most appropriate for the atmospheric temperature of the place of use.



- Use engine oil of CC class or higher of API service classification.
- Oil for summer (SAE30) is recommended for use in summer, and oil for winter (SAE20) is recommended for use in winter. In addition, oil for all seasons (SAE10W-30), the viscosity of which hardly changes by temperature, is recommended for use throughout the year. Select appropriate engine oil in accordance with the lower right table.
- The oil volume required for oil change is as follows.

SAE viscosity and applicable temperature range

Gross engine oil volume	Fresh air temperature (°C)
1.2 L	-30 -20 -10 0 10 20 30

[Caution]: Do not mix engine oil of different kinds. It is because properties of the engine oil may become inferior, if engine oil of different kinds is mixed together.

(2) Check of fuel level

<p> CAUTION: Fire</p> <ul style="list-style-type: none">▪ Fuel and oil are combustible materials. Never bring any fire close to the welder. Do not use the welder in a place where the welder exposed to sparks of welding or of a sander. Do not perform fueling while you are smoking or while the welder is running.▪ If the fuel or oil has spilt, fully wipe it off. <p>Ignition or kindling may occur, a fire may arise and burn injury may result, if you fail to observe the precautions given above.</p>	
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Check, by observing the Fuel gauge.

If the fuel is low, fill the fuel tank with clean and fresh NON-LEAD gasoline. Do not over fill the fuel tank. The fuel tank cap must be closed tightly after filling.

If the fuel is contaminated, close the fuel cock and drain to the receiver pan from the cup / tank.

Regarding fuel

- (a) Use NON-LEAD gasoline. Do not use any alternative fuel because its quality is not known, it exerts adverse effect over the engine.
- (b) Do not over fill red marking at fuel filler port filter.

[Caution]: If the fuel or oil has spilt, fully wipe it off.

Be cautious of the fuel!!

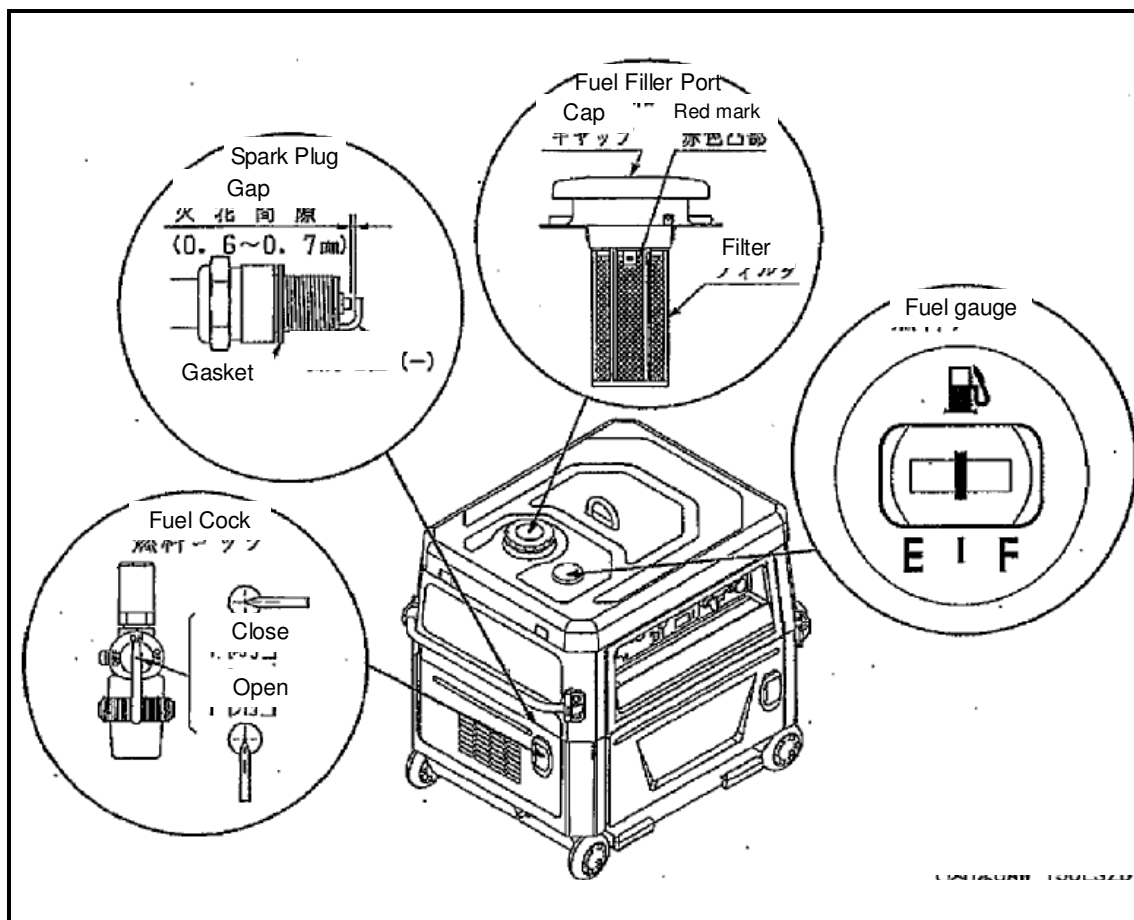
- Never fill the fuel tank while the engine is running or in the dark. Gasoline soilage on a hot engine can cause a fire or an explosion. If gasoline spillage occurs, wipe up the spilled gasoline completely to prevent hazards.

(3) Open the fuel cock

(4) Check the spark plug

Do not touch the spark plug, cable and cap, while the engine is running.

Make sure to stop the engine, before check the spark plug and using a plug removal tool.



(5) Check of pipe joints

Check pipe joints for looseness, oil leakage. Carry out repair or replacement, if any abnormality is found.

(6) Check of wiring

Check wiring for loose connection and wear. Carry out repair or replacement, if any abnormality is found.

[Caution]: Do not run the welder in the state where the welder is covered with a sheet or in the state where any article is placed on the exhaust hole or air outlet. Moreover, make sure that the air intake hole is not plugged.

(7) Connection and check of battery cables

Connect battery cables in correct polarity. If connection is made in incorrect polarity (reversing of + and -), electric components will be damaged, even if such an error occurred only for a short length of time.

[Caution]: Connect battery cables in the state where the starter switch key is removed.

Applying small amount of grease to battery terminals will prevent corrosion to terminals. Furthermore, firmly connect cables to terminals. If connection is insufficient, malfunction may arise due to faulty contact, and troubles may result.

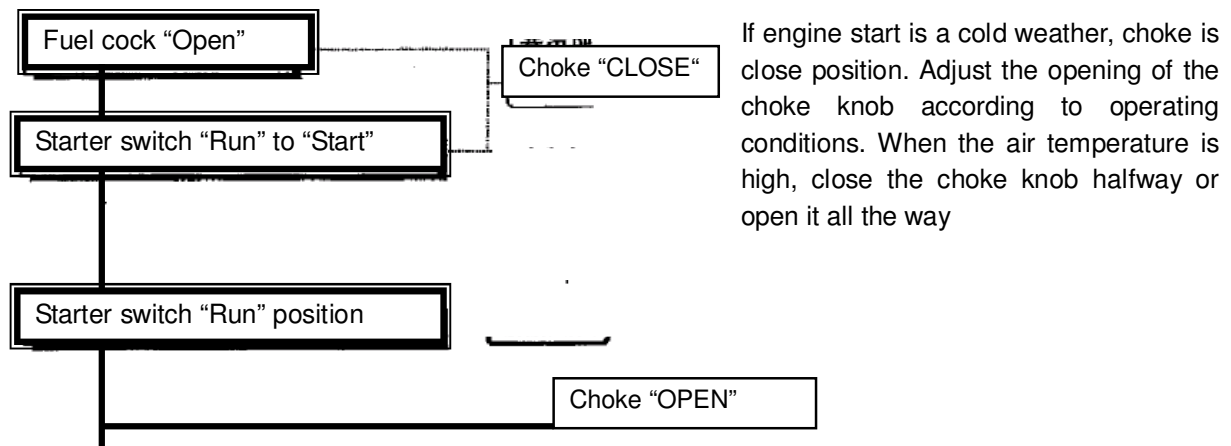
3-2 Startup and running

Make sure that no obstacle is located in the range of 1 m from the welder, and send a signal to the people located around the welder, before starting the engine. Furthermore, lock the engine while it is running, so that operation by anybody having no knowledge on the welder or welder operating skill is disabled.

- Select the using frequency by the frequency select switch located inside the door.

[Caution]: Do not change the frequency, while the engine is running.

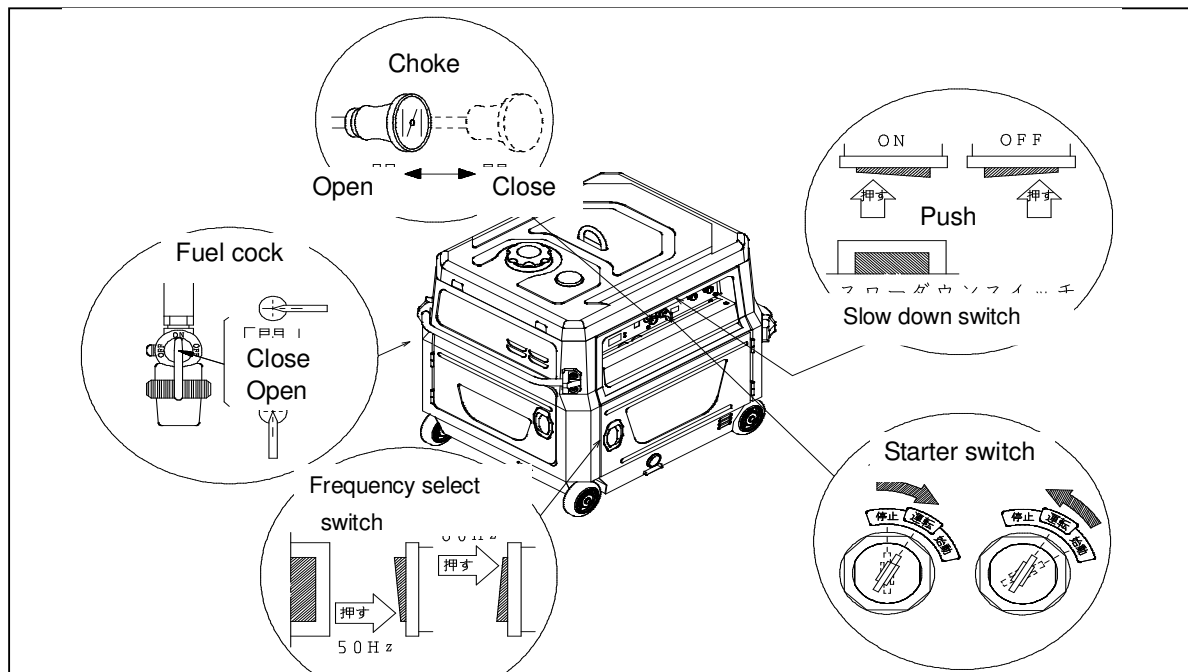
- Slow down switch "ON" position.
- Make sure the machine abnormality and close the door.



Warm-up (After the engine start, let the machine idle more than 5 minutes to warm-up)

[Caution]: If no ignition tone is produced even after turning the starter motor for about 10 seconds, it is essential to allow a pause time of at least 10 seconds in the state where the starter switch is returned to the "STOP" position, before turning the starter motor again.

[Caution]: If the starter switch does not return to the position of the "operation" automatically, please return to the "operation" manually. Could be damaged by the starter motor continues around.



Push

Push

[Caution]: Do not turn the starter switch while the engine is running.

- If abnormal vibration or abnormal noise was observed, stop the engine and carry out inspection. Moreover, check for emission of black smoke or white smoke.
- Keep all the doors closed and keep the side door locked during running.
If any door is kept open, the welder may be damaged due to inclusion of foreign matters. In addition, cooling conditions may become inferior due to changes in the airflow, and troubles may result.
- Watch meters on the operation panel during running, and make sure that normal ranges are not exceeded and no warning lamp is lit. If any warning lamp lights up, immediately stop the engine and check the abnormal point.
- Make sure that the cumulative hour meter is working during running.
It starts working upon start-up of the engine.
- After the engine starts, let the machine idle for more than 5minutes to warm-up.

(1) Do not turn the starter (switch “Start” position) over than 10seconds.

If the machine fails to start despite repeating the starting procedure, there is obviously some problem with the machine.

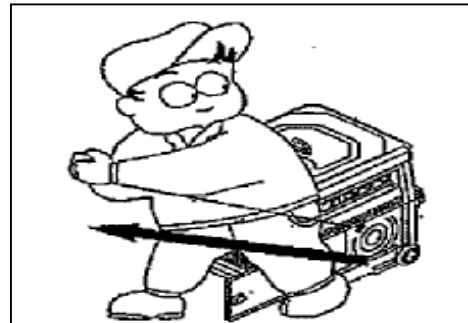
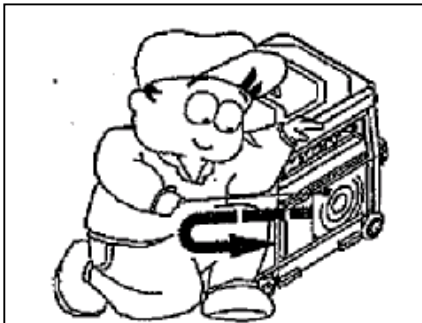
Therefore a thorough check is required (e.g. : Fuel has run out, forgetting to turn the fuel cock to the open position and battery leakage)

(2) Recoil start

If the machine is could not to start by starter switch caused by battery leakage etc., Can be start by the recoil start.

If using recoil start, the starter switch to “Run” position.

- Pull out the recoil starter knob slowly, make sure engaged latch of starter (pull the rope feel heavy) and pull out strongly.
- After the engine is started, return to the recoil starter knob slowly.



(3) After the engine starts, let the machine idle for more than 5minutes to warm-up.

(4) If abnormal vibration or abnormal noise was observed, stop the engine and carry out inspection. Moreover, check for emission of black smoke or white smoke.

(5) Keep all the doors closed and keep the side door locked during running. If any door is kept open, the welder may be damaged due to inclusion of foreign matters. In addition, cooling conditions may become inferior due to changes in the airflow, and troubles may result.

(6) Make sure that the cumulative hour meter is working during running. It starts working upon start-up of the engine.

3-3 Stopping

- (1) The engine revolution drops when the slow down switch is push to the “ON” position. Continue cool-down running for about 5 minutes in this state.
- (2) Stop the engine by turning the starter switch to the “**STOP**” position.
- (3) If the engine fails to stop even when starter switch is turned to the “STOP” position, use one out of two methods indicated below for forcibly stopping the engine.
- (4) After the engine has stopped. Turn the fuel cock to the “CLOSE” position and remove the key out of the starter switch.

3-4 After stopping

- (1) In case it is intended that the welder will not be used for a certain length of time, be sure to remove the starter switch key, and keep it in the specified position with care exercised not to lose it.
- (2) Turn the fuel filter cock to the “CLOSE” position.
- (3) Disconnect the welding cable. Disconnect cables and plugs from AC power outlets.
- (4) Keep refueling the fuel tank. If left in a state in which the fuel in the fuel tank is low, water droplets adhering fuel is evaporated, water accumulates in the fuel tank.
- (5) Check out the loose bolts and nuts. Be retightened if there is nuts and bolts that are loose.
- (6) Upon confirmation of complete cool-down of the welder, cover up the welder with a sheet or the like and store the welder in a place of little humidity. Do not leave the welder in open air.

3-5 Protective devices

The welder is equipped with protective devices indicated below that act against errors during running. When any of these protective devices is activated, immediately stop running of the welder and carry out troubleshooting of the abnormal point.

List of protective devices

Action Item	Engine shut down	AC output shut down	Welding output shut down	Lamp indication	Release of protecting
Oil level drop	○	---	---	○	Oil feed
Control unit input over voltage	---	○	---	---	Release automatically by engine revolution slow.
AC output over current	---	○	---	---	AC power output switch "OFF" position.
AC output over voltage	---	○	---	---	AC power output switch "OFF" position.
AC control unit high temperature	---	○	---	---	AC power output switch "OFF" position and unit temperature fall.
Welding control unit high temperature	---	---	○	---	Release automatically by temperature fall.

Note: In case of fuse blow, check the wiring for abnormality and check for entry of foreign matters, before fuse replacement.

4. Welder operation

4-1 Warning on matters to be observed prior to operation



DANGER: Make sure to observe the following instructions for avoiding serious accidents resulting in injury or death.

- (1) Observe laws and regulations and your in-house standards for working power sources on the input side, setup of place of installation, handling of high-pressure gases, storage and piping, storage of products after welding, disposal of waste and others.
- (2) Take measures to prevent people from entering improperly the section around the welder and the welding work area.
- (3) If you use a pacemaker for your heart, do not enter the section around the welder and the welding work area until your doctor permits it. A welder produces a magnetic field around the welder while electric power is fed to it, and exerts adverse effect over the operation of your pacemaker.
- (4) To secure safety, it is necessary that qualified persons or those who fully understand the welder execute installation, maintenance and inspection as well as repair to this welder.



DANGER: Make sure to observe the following instructions for avoiding electric shock.

- Fatal electrical stunning and burn may arise, if you touch any live part.


- (1) Do not touch any live part.
- (2) Do not use a cable of insufficient capacity, a damaged cable or a cable with exposed conductors.
- (3) Be sure to tighten and insulate each cable joint.
- (4) Do not use the welder in the state where the case or cover is removed from it.
- (5) Do not use broken or wet gloves. Always use dry insulating gloves.
- (6) Use a life rope in case of working in an overhead location.
- (7) Conduct periodic maintenance and inspection. If any damaged portion was found, repair it before use.
- (8) Turn off the power for all the equipment when the welder is not used.




DANGER: Make sure to observe the following instructions for avoiding fire, explosion and burst.

- Spatter and hot base metal immediately after welding may trigger fire.
 - If there is any point of incomplete contact in the cable or in the current path on the base metal side such as steel, fire may break out due to heat generation caused by current conduction.
 - A container for combustible substance such as gasoline may explode, if arcing occurs to it.
 - An enclosed tank or pipe may burst when it is welded.
- (1) Remove combustible materials from the surrounding area, so that scattering spatter will not hit combustible materials. If they cannot be removed, cover them up with incombustible covers.
 - (2) Do not perform welding in the vicinity of combustible gases.
 - (3) Do not bring hot base metal immediately after welding close to combustible materials.

- (4) For welding of the ceiling, floor, wall or the like, remove hidden combustible materials.
- (5) Be sure to tighten and insulate cable joints.
- (6) Connect the cable on the base metal side to as close as possible to the welding point.
- (7) Do not weld a gas pipe containing gas. Do not weld an enclosed tank or pipe.
- (8) Locate fire extinguishers near the welding work area for emergency use.

 **CAUTION:** Wear protective equipment for protecting you and other people against fumes and gases produced during welding.

- Health hazard may arise, if fumes and gases produced during welding is inhaled.
 - Suffocation may occur due to shortage of air, if welding work is performed in a small space.
- (1) Provide sufficient ventilation or use air breathing equipment or the like, for preventing gas poisoning and suffocation, in a place specified in laws and regulations (Ordinance on Labor Safety and Hygiene, Ordinance on Prevention of Anoxia).
 - (2) Use local exhausting equipment specified in laws and regulations (Ordinance on Labor Safety and Hygiene, Ordinance on Prevention of Dust Hazards) or use respiratory protective equipment, for preventing dust hazards and poisoning caused by fumes or the like.
 - (3) Provide sufficient ventilation or use respiratory protective equipment for welding in a small space. In addition, execute works in such a place under the supervision of well-trained supervisors.
 - (4) Do not perform welding work in a place near the area where degreasing, washing and or spraying work is in progress. Noxious gases may be produced, if welding work is performed near such a place.
 - (5) For welding of coated steel products, be sure to provide sufficient ventilation or use respiratory protective equipment. Noxious fumes and gases may be produced when coated steel products are welded.
 - (6) When welding work is performed at the bottom of a tank, boiler, ship bottom or the like, gases such as carbonic acid gas and argon gas that are heavier than air will stay at the bottom. Provide sufficient ventilation or use air breathing equipment or the like in such a place, for preventing atmospheric hypoxia.

 **CAUTION:** Wear protective equipment for you and other people against arc light, scattering spatter, slag and noise produced during welding.

- Arc light may trigger inflammation to eyes and skin burn.
 - Scattering spatter and slag may cause damage to eyes and burn.
 - Noise may cause troubles in the acoustic sense.
- (1) For monitoring welding work or welding, use light shielding glasses of sufficient light shielding performance or welding protective masks.
 - (2) Use protective glasses for protection of eyes against spatter and slag.
 - (3) Wear protective equipment such as welding leather gloves, long-sleeved clothes, leg covers and leather aprons for execution of welding work.
 - (4) Provide protective curtains around the welding work area, so as not to allow entry of arc light into eyes of the people.
 - (5) Wear noise protective equipment if the noise level is high.



CAUTION: Examine the following matters for preventing electromagnetic hazards. Furthermore, examine the following matters again if any electromagnetic hazard occurs.

- Large current that rapidly changes during welding flows to the welder and weldment, and it may hinder nearby equipment by electromagnetic noise.
- (1) Do not share the ground for the base metal and welder with the ground for other equipment.
- (2) Firmly close and fix all the doors and covers of the welding power supply unit.
- (3) Minimize the length of the welding cable.
- (4) Lay the base metal side cable, holder and torch side cable alongside to each other.
 - Measures to be taken when any electromagnetic hazard occurs include the following.
- (1) Change the welder grounding point.
- (2) Space the affected equipment apart from the welding power supply unit, cables and welding work area.
- (3) Apply electromagnetic shielding to the entire welding work area.

Please consult with us, if the problem of electromagnetic hazard is not solved even after taking measures stated above.

4-2 Selection of welding cable

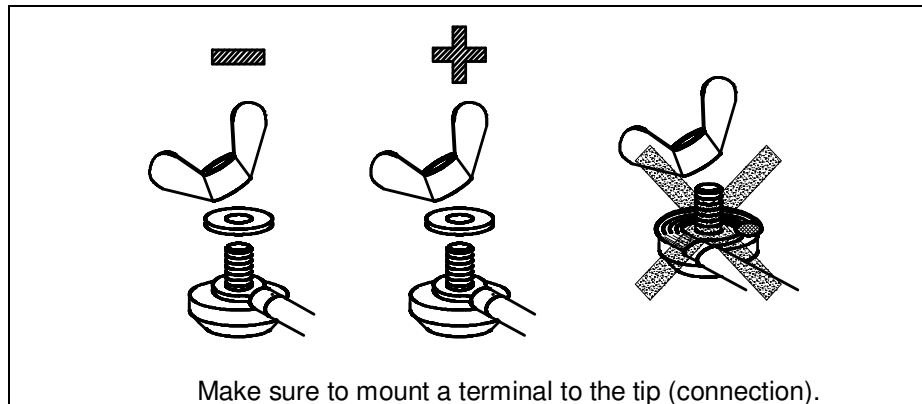
The longer the welding cable and the larger the current, a welding cable of larger size is required. Prepare a cable of appropriate size as selected out of the following table depending on the required welding current and cable length.

Relation between cable length and size (sectional area) for reducing cable's voltage drop to 4V or less

Cable length (m)		20	30	40	50	80	100
Cable size (mm ²) depending on welding current (A)	50 (A)	14	14	14	14	22	22
	100 (A)	14	14	22	22	30	38
	150 (A)	22	22	30	38	50	60
	185 (A)	22	30	38	50	60	80

4-3 Welding Cable and Polarities

- (a) Firmly connect the welding cable to output terminals located in the lower part of the control panel.



[Caution] (1) The welder will be damaged, if the cable is damaged or if tightness of connecting screws is insufficient.

Repair damage to the cable, and be sure to tighten connect screws.

- (2) If any cable end lead is connected to a terminal in a circular form after stripping, heat generation may arise due to faulty contact. Also burn to the insulator and short-circuit caused by contact of the lead with the welder body may result.

- (b) (+) and (-) are marked on output terminals. Select the polarity depending on the contents of the work. Typical use of polarity is shown below.

Typical use of polarity

Polarity	Connection	Typical application
Positive	(+)----- Ground (base metal)	Welding of structural steel and heavy plate
	(-)----- Welding electrode holder	

Reversed polarity	(+)----- Welding electrode holder (-)----- Ground (base metal)	Deposit welding, arc welding of thin sheets, arc welding of stainless steel, air gouging
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4-4 Adjustment of welding current

(1) Adjust welding current with the welding current regulator.

[Caution]: If two different welders are run simultaneously as connected to a common base metal in different polarity, the voltage between holders rises to a level produced by addition of voltages from two welders and electric shock may arise. Therefore, such a situation that one worker holds two holders of two different welders should be avoided absolutely.

[Caution]: When a common base metal is welded in different polarity using two different welders, make sure to separately connect grounding cables on the base metal side. If a common grounding cable is used and if its grounding is incomplete, troubles may arise to welders.

(2) The current regulating range is as indicated below. Select a current value that is appropriate for the work contents.

Applicable electrode

Current range	30-185 A
Welding electrode	Ø2.0-Ø4.0

(3) Arc force regulator

This machine is equipped with an “ Arc force regulator ”, the welding characteristic can be adjusted with the function. It 's useful when you want to change welding characteristic for peculiar welding.

(a) HARD

Its short circuit current is about 100A added welding current. It's easy to start arc and the power of arc strong in this mode. Particularly it's suitable for welding with high cellulosic welding rod.



[NOTE]: As it's short circuit current is restricted by a limited circuit to protect circuit board. The maximum short circuit current is approx. 230A.

(b) STANDARD

Its short circuit current is about 50A added welding current. It's easy to start arc and the stability of arc is superior in this mode. It's suitable for many kinds of welding rod.



(c) SOFT

Its short circuit current is almost same as large as the welding current. The arc is stable in this mode by its stable current characteristic.



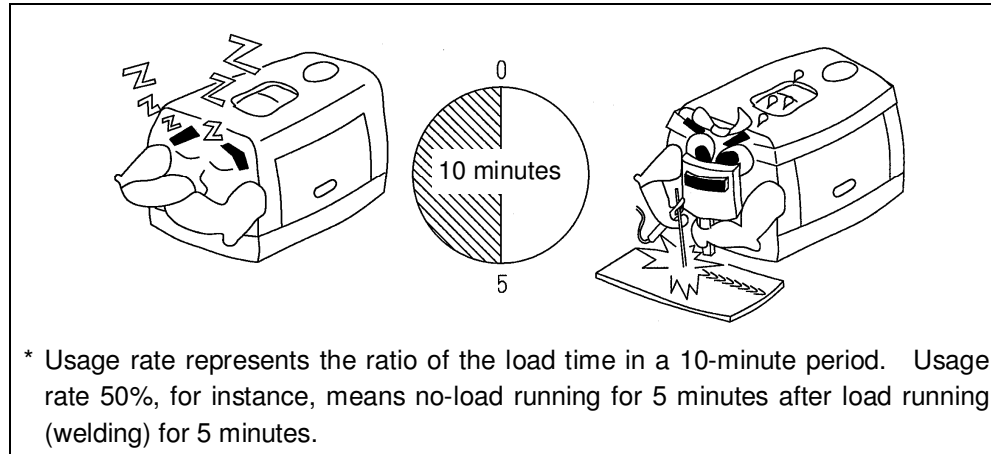
4-5 Slow down unit

- (1) This unit is provided for noise prevention and fuel saving during running without load. It executes control as described below in the state where the slow down switch is "ON."
 - 1) When welding is suspended for a while in the state where the welder keeps running, the engine revolution changes to a low level automatically (2500 min^{-1}) after elapse of a fixed length of time (about 9-10 seconds).
 - 2) When the AC output and welding output are used.
- (2) For normal use of the welder, set the slow down switch in the "ON" position.
- (3) When it is necessary to pay particular attention to the bead external appearances and welding defects, set the slow down switch in the "OFF" position.

4-6 Duty cycle

No matter how tough a person may be, he will be exhausted if he keeps working without rest. This welder is not of a design that withstands continuous use when it is used as a welder, from the viewpoints of job contents and economy.

Duty cycle indicated below explains this situation. It is the same for manual welding.



[Caution]: Be careful so that overload will not occur, referring to the following table.

Relation between used current and Duty cycle

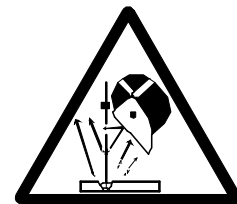
Duty Cycle (%)	100%	85%	70%	60%	50%	55%	40%
Used current (A)	120A	130A	140A	150A	160A	170A	170A

4-7 Regarding Stick welding work



CAUTION: Eye deficiency

- Always use a helmet and a hand shield for execution of welding work, for protection of eyes against harsh light and for protection of face and neck against the radiant energy directly irradiated from the arc.
- Eye injury may result if welding work is executed with naked eyes.**



Lens brightness numbers for welding work

Welding work	Brightness number
Electrode size for covered arc welding Ø1.6- Ø4.0	10
Ø5.0- Ø6.0	12
Ø8.0- Ø9.5	14

[Caution]: If there is any flammable substance (such as paper dust and wood chips) and/or dangerous articles (such as oil, grease and explosive) in the surroundings, remove them before starting

welding work.

[Caution]: Do not use this welder for any purpose other than welding.

4-8 Voltage reduction

- (1) This unit is assist in the reduction of electrical shock to personnel involved in welding activities. It reduces open circuit voltage to safe value before and after the welding operation.
- (2) The voltage reduction switch in the "ON" position, welding no load voltage become below 27V. Upon arc strike, normal selected voltage becomes available. Upon completion of welding, the open circuit voltage is returned to a safe value.
- (3) When it is necessary to pay particular attention to the bead external appearances and welding defects, set the voltage reduction switch in the "OFF" position.

4-9 Regarding AC power supply

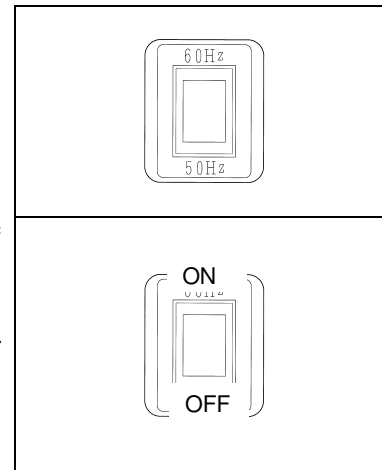
[Caution] : The welder will be damaged, if the cable is damaged or if tightness of connecting screws is insufficient. Eliminate damage to the cable, and be sure to tighten connecting screws.

[Caution] : If any cable end lead is connected to a terminal in a circular form after stripping, heat generation may arise due to faulty contact. Also burn to the insulator and short-circuit caused by contact of the lead with the welder body may result.

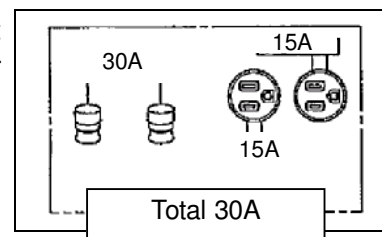
- (1) Switching between 50Hz and 60Hz

[Caution] : Do not frequency switching when use the AC output operation..

- (2) Do not execute load "ON/OFF" by connection/discontinuation of the power plug.
- (3) When the AC power supply is used, turn "OFF" the AC power output switch before making connection to the object equipment.



The capacity of each power receptacle is 15A and output terminal 30A. Up to 30A may be used in the total of power outlets. Connect load to them so that equal loads are applied to these two power outlets.



- (4) Please observe the current capacity of the output receptacles. Outlet to overheat when the octopus wiring to concentrate on one It becomes the cause of burnout. Please use it is distributed to the other outlets.
- (5) Grounding of load equipment
Ground the case of each load equipment like the case of the generator.
- (6) Grounding of case grounding terminal

Select a grounding rod and perform grounding work so that the grounding resistance is no higher than 100Ω by Class D grounding work specified in the Electrical Equipment Technical Specification. Select a grounding lead wire of size that corresponds to the generator capacity based on the Electrical Equipment Technical Specification.

4-10 Simultaneous use of welding power supply and AC power supply



Do not allow over loading when AC and DC are used simultaneously.




AC power supplies are used concurrently


Welding Rod	AC power supply capacity allowable for simultaneous use
0	3.0kVA
Ø2.0 (50A)	2.0kVA
Ø2.6 (80A)	1.4kVA
Ø3.2 (120A)	1.0kVA
Ø4.0 (150A)	0.5kVA


Simultaneous use of welding power supply and AC power supply should be avoided, in case particular importance is attached to bead external appearances and welding defects.

5. Periodic inspection and maintenance

<p> DANGER: Personal injury</p> <ul style="list-style-type: none"> • There are components rotating at high speed in the machine. • Make sure to stop the engine, before starting maintenance and inspection of the machine. <p>Personal injury may arise due to roll-in of your hands by rotating components, if you fail to observe the precautions given above.</p>	
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<p> CAUTION: Burn injury</p> <p>Never open the following places while the machine is running and also immediately after termination of running.</p> <p>(1) Radiator water filler cap If the water filler cap is opened while the machine is running, steam or hot water will jet out, and is extremely dangerous. Therefore, never open the water filler cap while the machine is running. Wait for at least 10 minutes after termination of running, before opening the cap. Furthermore, wear safety glasses and gloves, space your face away from the cap, fit thick rag on the cap and slowly turn the cap to relieve the pressure in the radiator before removing the cap.</p> <p>(2) Never touch any high temperature portion. Never touch the tail pipe, exhaust pipe and others, which are of high temperature while the machine is running and also immediately after termination of running.</p> <p>Burn injury will occur to your hands, if the above precautions are neglected.</p>	 
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<p> CAUTION: Casualty caused by battery</p> <p>(1) Casualty caused by battery electrolyte Be careful so as not to allow entry of battery electrolyte (dilute sulfuric acid) into eyes and not to allow its attachment to the skin or clothes. If it entered eyes or attached to the skin, immediately wash it off using plenty of water. In case of entry to eyes, submit to medical treatment. Casualty to eyes and burn may result otherwise.</p> <p>(2) Explosion caused by battery's flammable gases The battery produces flammable gases. Therefore, be careful not to allow sparking from the battery and not to bring any fire such as cigarette close to the battery. Ignition and explosion may arise otherwise.</p>

<p> CAUTION: CAUTION: Disposal of waste liquid and others</p> <p>(1) Observe regulations for waste treatment for disposal of oil, fuel, cooling water, hydraulic fluid, solvent, filter, battery and other hazardous substances and waste liquid.</p> <p>(2) Do not carelessly dispose any waste liquid drained out of this machine. It will destroy the environment. Discharge the waste liquid to a container, and apply appropriate waste treatment to it as industrial waste based on Water Pollution Prevention Law, Soil Pollution Prevention Law, Air Pollution Prevention Law and others. Discharge of untreated effluent to the ground surface and disposal to river, lake or the sea are forbidden.</p>

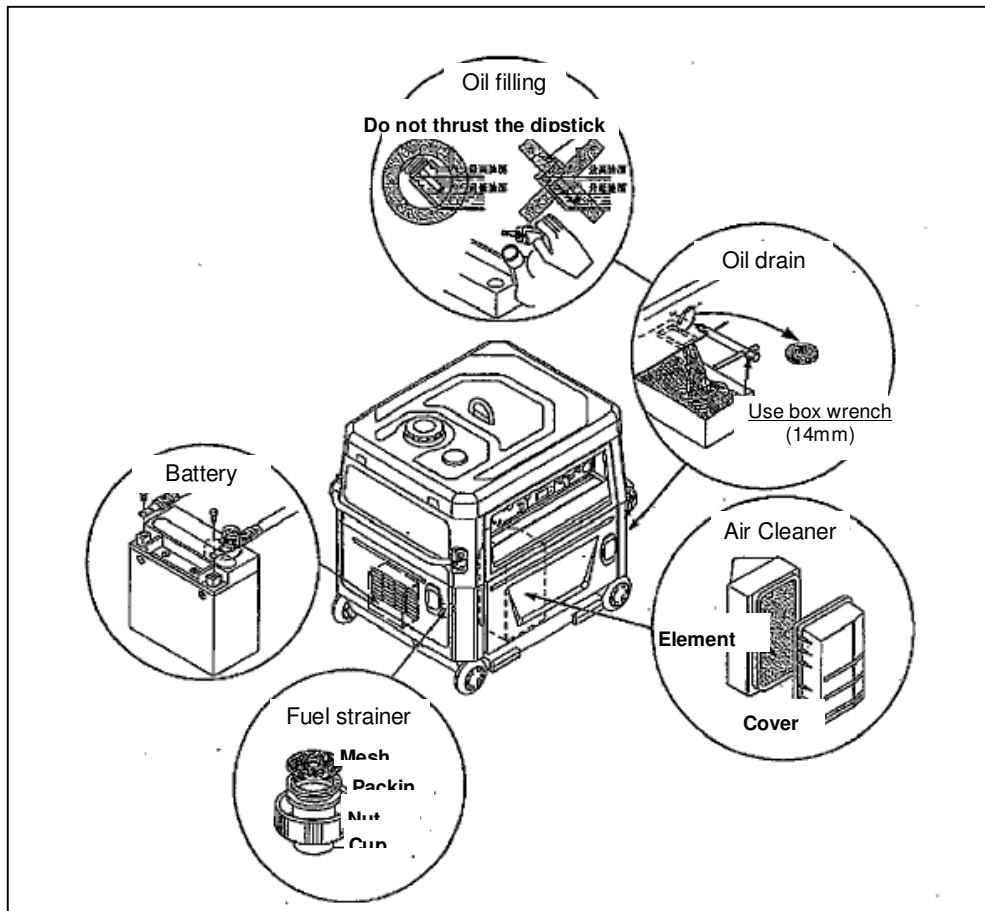
5-1 General inspection and maintenance prior to Operation

- (1) Check for loose, missing, damaged bolt/nuts or other fasteners.
- (2) Check for engine oil level and fill.
- (3) Check for fuel or oil leakage.

5-2 Initial 20-hour inspection and maintenance**(1) Change of engine oil**

Engine oil be replaced at an early period of either one month or after 20 hours after the start of operations.

- 1) Remove the engine oil drain plug, and fully discharge the engine oil.
Smooth discharge is permitted, if the work is performed while the engine is still warm.
- 2) Feed fresh engine oil through the oil filler port, up to the "H" level (upper limit) marked on the engine oil level gauge.
- 3) Run the engine for a while, assure that no oil leakage is observed, and then stop the engine.
Check the engine oil level about 10 minutes later. If the oil level is lower than the specified level, replenish oil.



5-3 Inspection and maintenance of once every 50 hours

(1) Cleaning of air cleaner element

Remove the cover and element. Wash the element in a non-flammable or high point solvent and squeeze thoroughly. Soak the element in the clean mixed oil and squeeze out of the excess oil, then reinstall the element and cover.

【Mixed oil ratio, kerosene 3 : engine oil 1】

Air cleaner element
Part No.: 06020 46697

[Caution]: Check the element for damage at the time of cleaning, and replace it if damaged.

Positively mount the element in such a manner that no air leakage will occur, with attention paid not

(2) Check hose joints for looseness, damage. Carry out repair or replacement, if any abnormality is found.

(3) Check wiring and connector for looseness, damage. Carry out repair or replacement, if any abnormality is found.

5-4 Inspection and maintenance of once every 100 hours

(1) Change of engine oil

(2) Cleaning of Fuel strainer

Remove the cup of the fuel strainer, cleaning inside the cup and strainer.

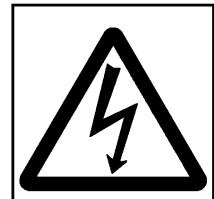
When remove the cup to be check for damage, oil leakage. Carry out repair or replacement, if any abnormality is found.

5-5 Inspection and maintenance of once every 200 hours



WARNING: High voltage and Electrical Hazard

- Do not touch the electrical component such as internal wiring and output Terminal during the operation. Need to stop the operation always when do the maintenance and inspection of the connection cable.
- Do not touch the machine when the body and the machine is wet because it is very dangerous.



If you neglect the caution death or serious fatal accident occur .

(1) Check and cleaning of spark plug

Remove carbon build up on the spark plug with wire brush. Set the spark plug gap to 0.6-0.7mm. Tighten with a spark plug wrench.

Spark plug maker : NGK
Model No.: BR6HS

(2) Measurement of insulation resistance

1) Measure the insulation resistance every 200 hours or per month by the insulation resistance

tester of 500V, to check whether there is more than 1MΩ.

Do not use the insulation resistance by the insulation resistance tester that exceeds 500V.

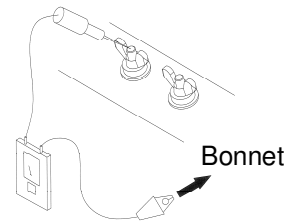
There is a possibility that the control device will be broken if you use it.

If you need to use the insulation resistance tester that exceeds 500V, take off all connector which is connecting to control unit.

2) Measuring methods

Take off a load side electric wire of the output terminal and make the AC output "ON".

Measure the insulation resistance between each welding output terminal bolt, interchange output terminal and outlet and the bonnet.



5-6 Inspection and maintenance of once every 300 hours

(1) Check and alignment of engine intake, exhaust valve

(as brought to a specified servicing workshop)

5-7 Inspection and maintenance of once every 500 hours

(1) Check of battery voltage and charge

(2) Tightening engine head (as brought to a specified servicing workshop)

(3) Check and cleaning of carburetor (as brought to a specified servicing workshop)

(4) Check and alignment intake, exhaust valve (as brought to a specified servicing workshop)

5-8 Inspection and maintenance of once every 1000 hours

(1) Replace the piston ring (as brought to a specified servicing workshop)

5-9 Other inspection and maintenance

(1) Replacement of fuel hose (as brought to a specified servicing workshop)

Replace fuel hose if the fuel hose has become hard or if the fuel hose has deteriorated.

(Fuel hose replace every 2 years)

(2) Replacement of noise absorbing materials (as brought to a specified servicing workshop)

Replace noise absorbing materials, if they are excessively contaminated or if exfoliation (attachment of fats) is observed.

6. Troubleshooting

Causes for troubles and actions to be taken against them

Almost all the troubles can be prevented by proper handling and by implementation of inspection and maintenance. If any trouble arises, take actions with reference made to the following description.

6-1 Engine malfunction and actions to be taken

If the engine malfunctions, take appropriate actions based on the following chart.

(See the instruction manual for the engine for details.)

Trouble phenomenon	Probable cause	Action
The engine hardly starts.	● Fuel is not flowing.	• Check the fuel tank and fuel strainer, and remove deposited impurities and moisture.
	● Fuel is not coming to Carburetor	• Check the fuel cock and open fuel cock.
	● Fuel is coming to carburetor.	• Check the spark plug • Check the ignition coil.
	● The battery power is weak, the turning force is weak, and the momentum to overcome the compression is not produced.	• Charge the battery. • In winter, dismount the battery, fully charge it and keep it indoors. Mount the battery, which is kept in such a state, to the machine before use.
The engine output is insufficient.	● The fuel is short.	• Check the fuel system.
	● The air cleaner is plugged.	• Clean or replace the element.
	● Clogging muffler tail screen	• Clean or replace the tail screen.
The engine halted all of a sudden.	● The fuel is short.	• Replenish the fuel. • Check the fuel system (with attention paid to entry of air).
	● Emergency stop was activated.	• Check the oil level.
The color of the exhaust gas is inferior.	● The fuel is inferior.	• Change with quality fuel.
	● The air cleaner is plugged.	• Clean or replace the element.

6-2 Troubleshooting chart

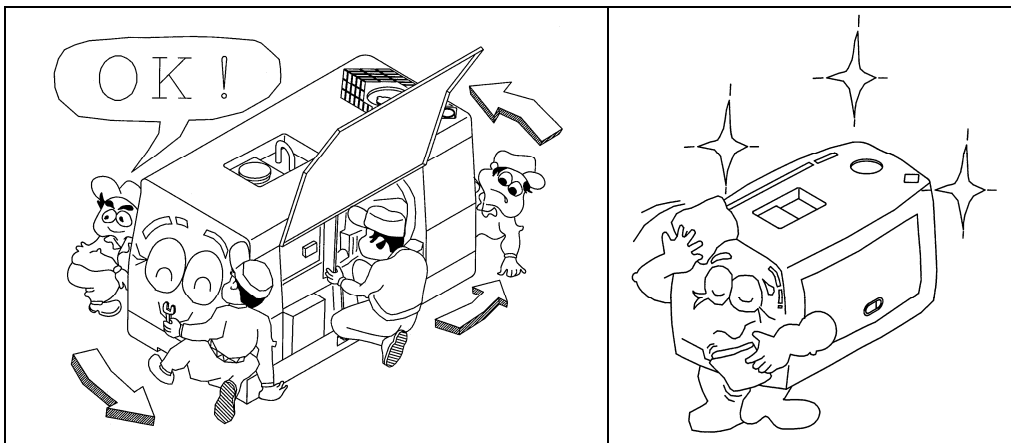
Trouble phenomenon		Probable cause	Action
Welding	No arc is produced.	<ul style="list-style-type: none"> ● Faulty cable connection ● Faulty generator main unit ● Failed control unit SCR ● Failed Reactor ● Failed thermo switch in control unit 	<ul style="list-style-type: none"> ● Check cable connection. ● Repair or replace the generator. ● Replace SCR ● Replace Reactor ● Replace thermo switch
	Welding current regulator fails to work.	<ul style="list-style-type: none"> ● Failed welding current regulator ● Faulty cable connection ● Failed board of control unit 	<ul style="list-style-type: none"> ● Replace the welding regulator. ● Check cable connection ● Replace board
Single phase AC power supply	No voltage (AC 100V) is produced, and no power is generated.	<ul style="list-style-type: none"> ● AC output switch "OFF" position ● Failed control unit ● Failed generator main unit ● Disconnected connector 	<ul style="list-style-type: none"> ● Push the AC output switch to the "ON" position. ● Replace control unit ● Replace the generator. ● Check the connection
Revolution control	<u>Slow down switch "ON"</u> The engine fails to run to increase high speed.	<ul style="list-style-type: none"> ● Failed board in control unit ● Failed engine governor ● Failed generator main unit ● Disconnected connector ● Failed engine compression ● Failed fuel strainer 	<ul style="list-style-type: none"> ● Replace board ● Replace or Repair ● Replace the generator ● Check the connection ● Repair the engine ● Cleaning / replace
	The engine fails to run to low speed.	<ul style="list-style-type: none"> ● Failed board in control unit ● Failed slow down switch ● Failed slow down solenoid ● Disconnected connector ● Welding output terminal is short 	<ul style="list-style-type: none"> ● Replace board ● Replace ● Replace ● Check the connection ● Repair
	<u>Slow down switch "ON"</u> The engine fails to run to high speed.	<ul style="list-style-type: none"> ● Failed engine governor ● Failed slow down switch ● Failed engine compression ● Failed fuel strainer 	<ul style="list-style-type: none"> ● Replace or Repair ● Replace ● Repair the engine ● Cleaning / replace

7. Long-term storage of the machine

Observe the following instructions for permitting the machine to exhibit its superior performance for an extended period of time.

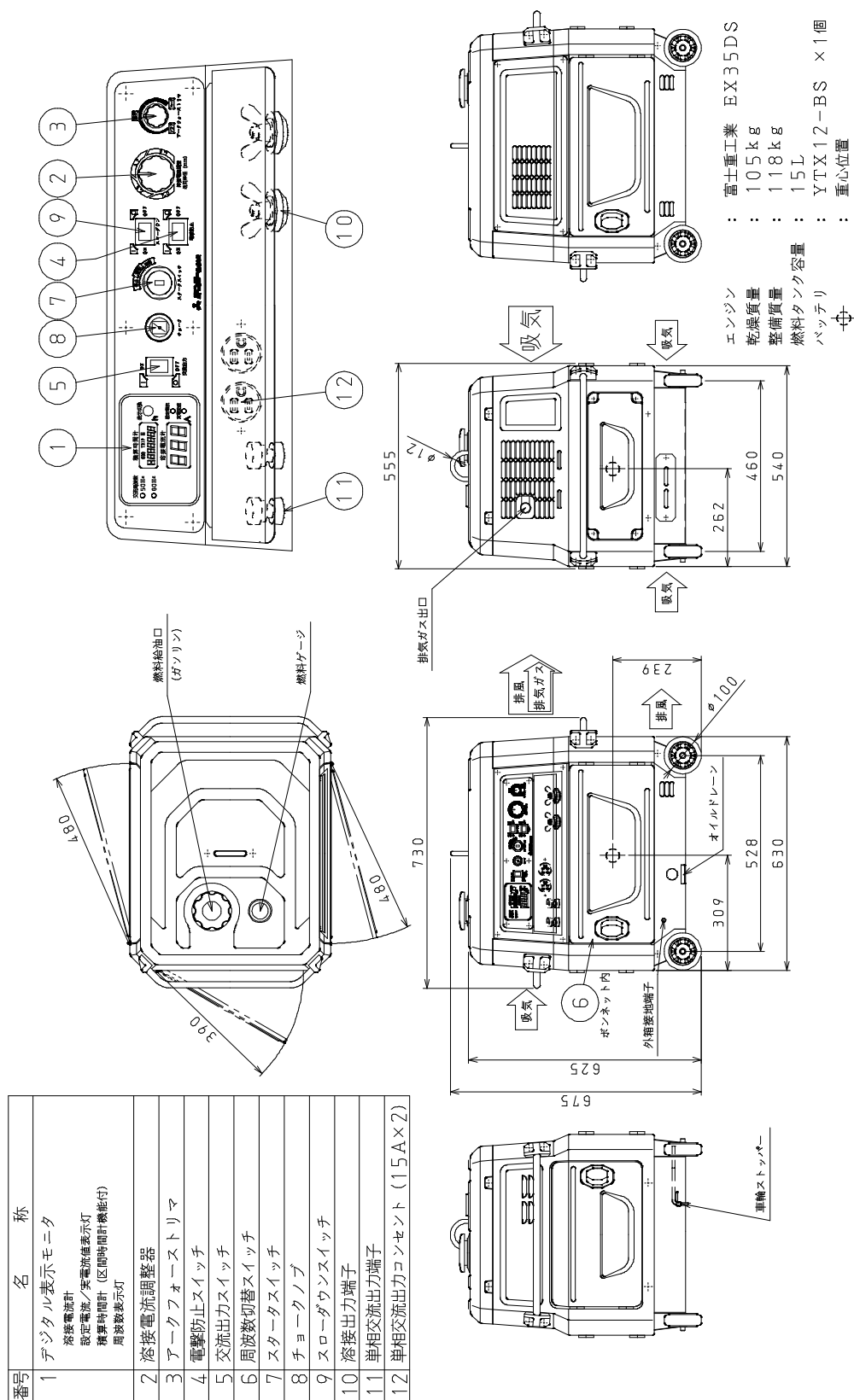
- (1) Check for oil leakage and fuel leakage, and check bolts and nuts for looseness.
- (2) Disconnect the battery cable from the (-) terminal of the battery, for storage of the machine for a long time.
- (3) The battery discharges naturally when it is shelved for a long time. Carry out auxiliary charge as the battery discharges.
- (4) Place the fuel cock to the "Shut" position while the driving, and use up the fuel in the machine. And stop an engine naturally.
- (5) Puled out the fuel in the fuel tank. Loose the drain of the carburetor to pull out the all fuel inside the carburetor.
- (6) Clean the air cleaner element.
- (7) Change the engine oil with fresh oil.
- (8) Apply grease to shining faces such as rod and links, for preventing rusting.
- (9) Paint grease to the part that has sparkling such as like choke wire in order to prevent rust.
- (10) Remove dirt from the interior and exterior of the machine, and store the machine as protected with a protective sheet in a place of little dust and moisture that is not exposed to weather. Do not keep the machine in the open air.

"See the engine instruction manual for handling of the engine."



8. Servicing data

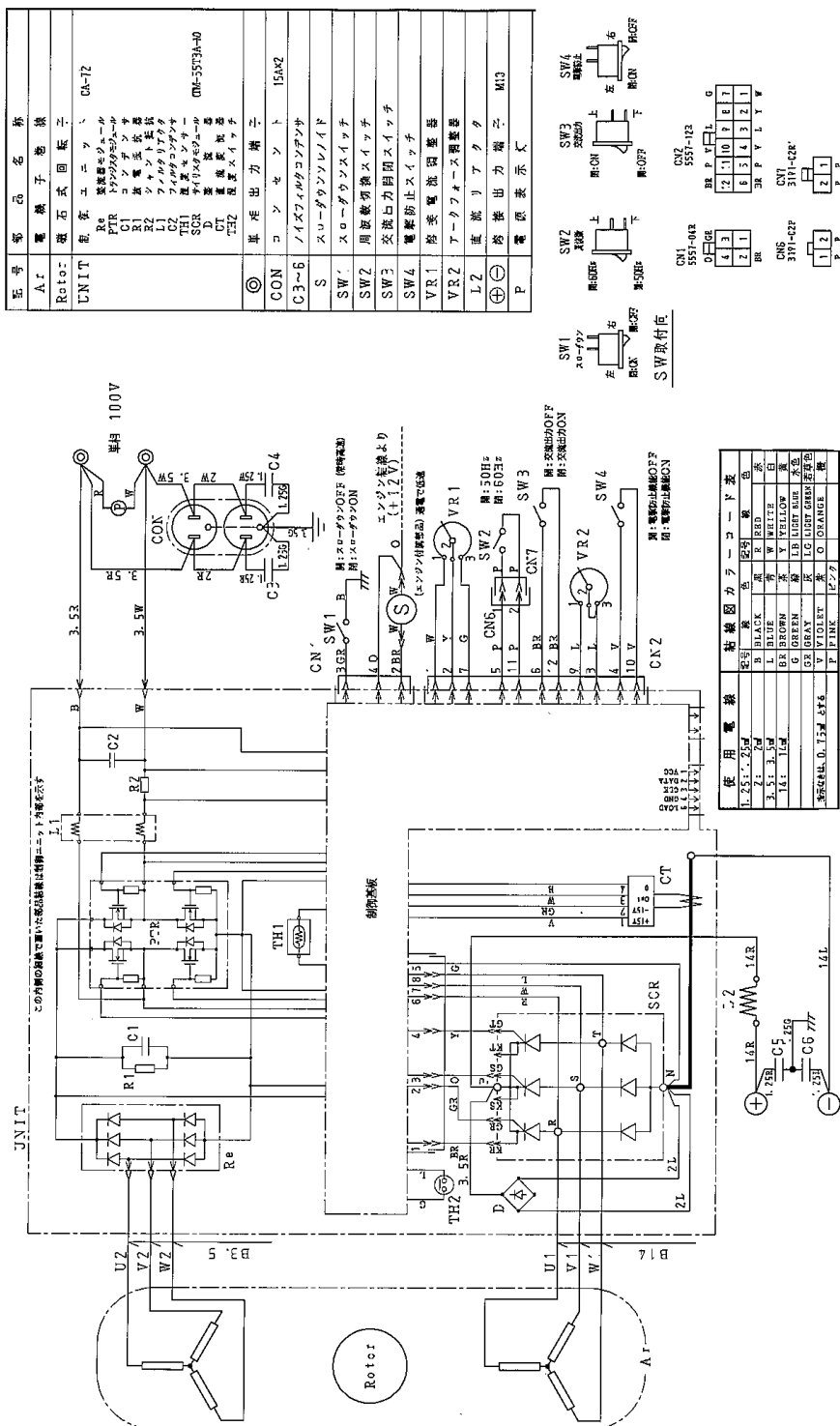
8-1 External dimensions and appearance drawing



8-2 Specification

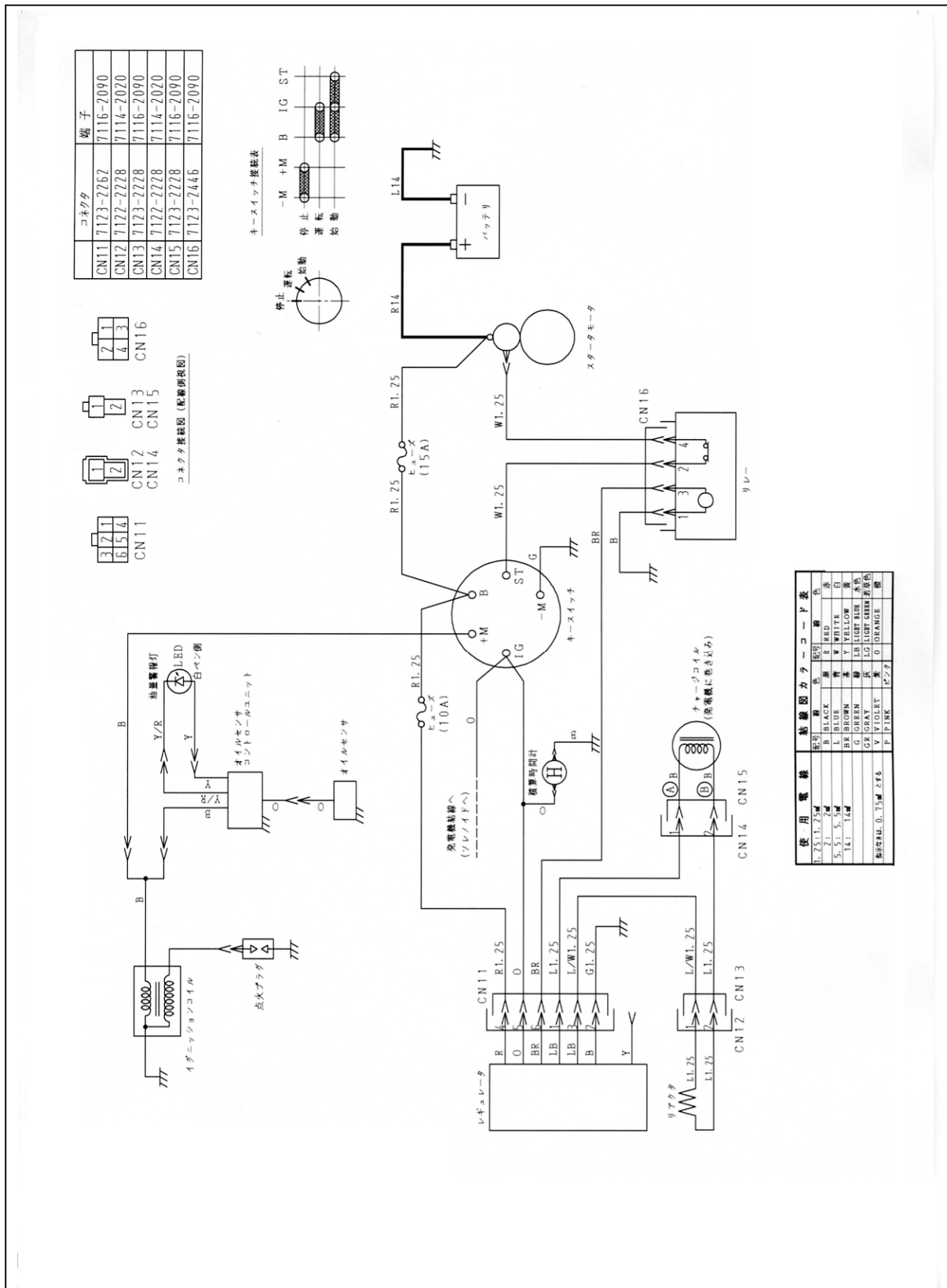
Type		GAW-185ES2	
DC welding power supply	Rated output	kW	4.58
	Rated voltage	V	26.8
	Rated current	A	170
	Duty cycle	%	50
	Current regulating range	A	30 – 150
	Applicable welding rod	mm	φ2.0 – φ4.0
Single phase AC power supply	Number of phases		Single phase
	Rated output	kVA	3.0
	Rated voltage	V	100
	Rated current	A	30
	Frequency	Hz	50/60
	Rated revolution	min ⁻¹	3600
	Power factor		1.0
Engine	Name		Fuji heavy Industrial EX35DS
	Type		4-stroke cycle Air-cooled OHC gasoline engine
	Number of cylinders – Bore × Stroke	mm	1 – 89 ×65
	Total displacement	L	0.404
	Rated output	kW/ min ⁻¹	6.3 / 3600
	Used fuel	L	Unleaded automobile gasoline
	Fuel tank capacity	L	15
	Lubricating oil total volume	L	1.2
	Lubricating oil effective volume	L	0.6
	Starting method		Electrical (starter motor) / Recoil method
	Used battery		YTX12-BS (12V-10Ah/10HR)
External dimensions		See external dimensions and appearance drawing	
Dry weight		kg	105
Total weight		kg	118

8-3 Generator wiring diagram

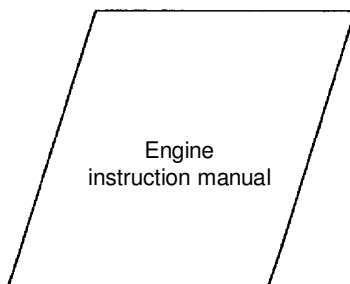
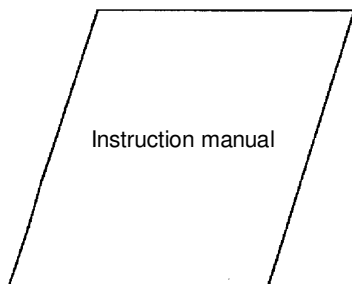


コネクタ接続図(配線側見図)

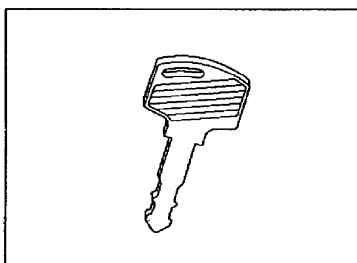
8-4 Engine wiring diagram



8-5 Attachment



Starter key



Plug wrench

